

NOTES AND NEWS

A MALE STERILE MORPH IN *Lycium fremontii* (SOLANACEAE) FROM BAJA CALIFORNIA SUR.—Hitchcock (Ann. Missouri Bot. Gard. 19:179–360, 1932) recognized that *Lycium fremontii* Gray is an unusually variable species. In describing *L. fremontii* he noted (p. 294) “The flowers are strikingly dimorphic, one type having a tubular corolla, which is but one and one half the length of the calyx, the other extreme having a funnellform corolla fifteen millimeters in length, the tube being much flared at the summit, and the anthers frequently but partially developed.” He suggested that the difference may be due at least in part to the age of the branches: flowers from old branches usually are reduced in size, whereas the leaves and flowers of young twigs are twice their size. Apparently the functionality of gynoecia and androecia was not determined. Herbarium specimens examined by Hitchcock were from Arizona and California in the United States and Sonora and Baja California Sur, Mexico.

I made collections of *Lycium fremontii* in Baja California during January 1981 at Punto Conejo, an area sporadically inundated during recent geological times, situated 160 km north of the Cape on the Pacific side of the 1200 km-long peninsula. In the southern half of the Peninsula the shore line has retreated and advanced repeatedly during the Pleistocene and recent times (Durham and Allison, Syst. Zool. 9:47–91, 1960). Among conspicuous plants in the area are *Machaerocereus gummosus* (Engelm.) Britt. & Rose, *Bursera hindsiana* (Benth.) Engelm., *Fouquieria diguetii* (Van Tiegh.) Jtn., *Opuntia cholla* Weber, *Simmondsia chinensis* (Link) Schneider, *Stegnosperma halimifolium* Benth. The study area is in a shallow arroyo at Pto. Conejo from 90 to about 200 m inland from the beach. While collecting other shrubby species common in the area, I noticed two types of flowers of *Lycium fremontii*. Individual plants possessed one floral type only.

Flowers from plants of one morph consistently had included stamens, exerted stigma, and short corolla tubes that were noticeably constricted a few mm above the corolla base (Fig. 1-1). Plants of the other morph had larger flowers with only the stamens exerted in the throat of the long corolla tube (Fig. 1-2). The only *Lycium* populations in the study-area were of the two morphs and a very distinct second species, *L. richii* Gray (*L. brevipes* sensu Wiggins) growing nearby. Individuals of the two morphs were growing one to several meters apart and plants of both morphs were equally robust. They were easily identifiable as *L. fremontii*. Plants were in full flower and flowers were abundant on both morphs but the second morph had fewer fruits.

Two to four flowers from each of four different plants were prepared for pollen viability tests using Alexander's acid fuchsin-malachite green stain (Stain Technol. 44: 117–122, 1969). Anthers from the morph with included stigmas produced abundant pollen and 96% of the grains were filled. Stamens of the flowers with exerted stigmas were less than half the size of those of the other morph. No pollen was found in any of the anthers of 20 flowers of the morph having stigmas exerted. In order to provide a comparison with a different species of *Lycium* occurring adjacent to the study area, flowers of *L. richii* Gray were examined. Percent filled grains was between 85% and 98%. The latter species consistently had exerted stigmas and these were bilobed and as broad as the exerted stigmas of *L. fremontii*. Included stigmas of *L. fremontii* were narrow, and not bilobed.

Two distinct morphs of *L. fremontii* coexist at Pto. Conejo, Baja California Sur. Because the plants with small anthers formed no pollen at all, although producing fruit, these plants were male-sterile. The other morph produced apparently viable pollen but the degree of female-sterility of this morph is unclear. As mentioned, stigmas remained unlobed and very few fruits were evident. A single fruit with seeds was found on one plant. Lloyd terms plants whose ovular contribution is small as inconstant males rather than hermaphrodites (Lloyd, New Phytol. 71:1181–1194, 1972). No Solanaceae are known to be heterostylous (Ganders, New Zealand J. Bot. 17:607–636, 1979). Symon (The biology and taxonomy of the Solanaceae, p. 384–397, 1979) employs the term stylar hetero-

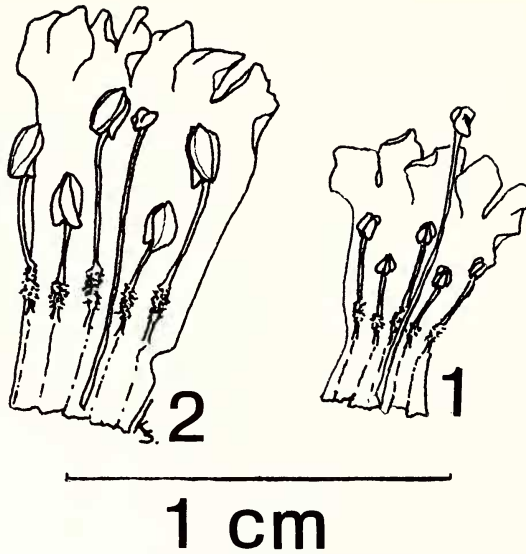


FIG. 1. Line drawings of flowers from the two morphs of *Lycium fremontii*. (1) morph with stigma exserted and stamens with included small anthers (Gilmartin 2845, WS), (2) morph with stigma included and anthers in the throat of the corolla (Gilmartin 2844, WS).

morphy for *Solanum* species with 2 morphs in which the short styled flowers are female-sterile.

Further studies are required to determine the percentage of flowers that are female-sterile, populational proportion of individuals that are functionally female, and the proximate cause of female sterility individual flowers of the pollen producing morph. While, to date, Pto. Conejo is the only place where I have noted the two morphs of *L. fremontii*, I suspect that a search of other areas where the species occurs may reveal them elsewhere in the Cape Region of the Peninsula, e.g., Bahia de los Muertos.

Support for this project was provided by the Center for Field Research. The help of the following expedition members is acknowledged: D. Gilmartin, E. Malmgren, R. Malmgren, L. McNeel, C. Mapes, B. Simons, M. Simons, and C. Wagner. Line drawings were rendered by K. Simmons.—A. J. GILMARTIN, Ownbey Herbarium, Department of Botany, Washington State University, Pullman 99164. (Received 21 Jan 1982; revision accepted 31 May 1982.)